A2LA Assessor Environmental Method Checklist

Extractable Organic Compounds - (GC)

Item	Section 1 - Personnel	Reference	Yes-No or NA	
1.1	Does the analyst(s) interviewed meet the job description position requirements, training and qualifications for performing the test? Supervisor:_____ Technician:_____	(G25)6.1		

Item	Section 2 - Equipment & Facilities	Reference	Yes-No or NA	
2.1	Is a laboratory aspirator vacuum system of a sufficient capacity to maintain a vacuum of 8 to 10 mm mercury?	(ORDO1)506,6.6(7/90)		
2.2	Is a drying column containing about 10 cm of anhydrous sodium sulfate and solvent rinse used to prohibit residual water from contaminating the extract?	(ORDO)508,11.3 (1989)		
2.3	Is a continuous liquid-liquid extractor equipped with Teflon or glass connecting joints and stopcocks requiring no lubrication?	(SW846)3520B,4.1 (9/94)		
2.4	Is a Kuderna-Danish (KD) apparatus with a concentrator tube, evaporation flask, Snyder columns, and springs available for extraction?	(SW846)3520B,4.3 (9/94)		
2.5	Is a water bath capable of temperature control within $\pm$ 5°C?	(SW846)3520B,4.5 (9/94)		
2.6	Is a water bath capable of temperature control within $\pm$ 2°C?	(ORDO1)506,6.3(7/90)		
2.7	Is a Soxhlet extractor with a 500 mL round bottom flask, extraction thimble and drying column with Pyrex glass wool available for extracting soil or solid samples?	(SW846)3540B,4.0 (9/94)		
2.8	Is an ultrasonic disrupter with a minimum power wattage of 300 watts with pulsing capability and a 3/4”horn for low concentration method and 1/8”tapered microtip attached to a 1/2”horn for medium/high concentration method available for extracting soil, sludge and wastes?	(SW846)3550A,4.2 (9/94)		
2.9	Does the gas chromatography unit contain capillary column, temperature programming capabilities, syringes, analytical columns, gases, detector and data recorder or data system to meet the method performance criteria?	(ORDO)508,6.8(1989)		

Item	Section 3 - Method	Reference	Yes-No or NA	
3.1	Is all glassware cleaned by rinsing with the last solvent used followed by washing with detergent and hot water, rinsing with tap and reagent water, air-drying and heating (non-volumetric glassware) in a muffle furnace for 1 hour at 400°C or solvent rinsing?	(ORDO)508,4.1.1 (1989)		
3.2	Is the sample extraction method selected dependent on the physical characteristics of the sample performed for the matrix, and adding the appropriate surrogate standards and matrix spiking solutions prior to extraction?	(SW846)3500A,7.1 (7/92)		
3.3	Is the appropriate extraction method referenced with the test method?	(SW846)8000A,7.1 (7/92)		
3.4	Are reagent grade chemicals used in all tests?	(SW846)8080A,5.1 (9/94)		
3.5	Are stock standards prepared in the appropriate solvent every two months using volumetric techniques and corrected for weight if the purity of the compound is certified less than 96% if standard solutions are not purchased from a commercial supplier certifying the concentration?	(ORDO)508,7.10 (1989)		
3.6	Are calibration standards, internal standards and surrogate solutions in a vial, stored in a dark place at room temperature and checked frequently for signs of degradation or evaporation?	(ORDO)508,7.11,12,13(1989)		
3.7	Is the single calibration point within ± 20% of the sample response when using the single point calibration method?	(ORDO)508,9.2.5 (1989)		
3.8	Is a minimum of three calibration standards prepared that bracket the sample concentration range, with the lowest concentration level being near, but above, the estimated detection limit and are surrogates and internal standards added to the calibration standards for developing internal calibration?	(ORDO)508,9.2(1989)		
3.9	Is a minimum of three calibration standards prepared that bracket the sample concentration range, with the lowest concentration level being near, but above , the estimated detection limit and are surrogates added for developing external calibration?	(ORDO)508,9.3(1989)		
3.10	Are five standards containing each analyte prepared that bracket the range of concentrations found in the samples with the lowest standard being near and above the method detection limit?	(SW846)8000A,7.4.2 (7/92)		
3.11	Are five standards bracketing the concentration range containing each analyte and internal standards used to calculate the response factor for each compound?	(SW846)8000A,7.4.3 (7/92)		

3.12	Are at least three standards containing each analyte prepared that bracket the range of concentrations?	(CFR136)608,7.2 (6/86)		
3.13	Is the working calibration curve or calibration factor verified at the start and end of the sample run at two different concentration levels or, for greater than 8 hours of analysis, are check standards interspersed with samples at regular intervals?	(ORDO)508,9.3.3 (1989)		
3.14	Is the ratio of the response to concentration less than 20% RSD over the working range so linearity through the origin can be assumed and the average ratio or calibration factor is used in place of a calibration curve?	(ORDO)508,9.3.2 (1989)		
3.15	Is the ratio of the response to concentration less than 10% RSD over the working range so linearity through the origin can be assumed and the average ratio or calibration factor is used in place of a calibration curve?	(CFR136)608,7.2.2 (6/86)		
3.16	Is the average response factor used when the RSD is less than 10% for the calibration range of standards when using the internal standard calibration method?	(CFR136)608,7.2 (6/86)		
3.17	Is the GC column primed or deactivated by injecting a PCB or pesticide standard mixture approximately 20 times more concentrated than the mid-concentration standard prior to initial or daily calibration when the GC column has not been used for more than one day?	(SW846)8080A,7.3.1 (9/94)		
3.18	Are the calculations and identification of multi-component peaks per the method?	(SW846)8080A,7.6 (9/94)		
3.19	Is chlordane reported as the individual residues when the GC peak pattern does not resemble technical chlordane?	(SW846)8080A,7.6.4 (9/94)		
3.20	Are pesticide degradation problems checked by injecting a mid-level standard containing 4,4'-DDT and endrin and looking for degradation products?	(ORDO)508,7.9.1 (1989)		
3.21	Is the retention time window based upon the actual retention time variations of the standards over the course of a day using three times the standard deviation to calculate a suggested window size for a compound?	(ORDO)508,11.5.2 (1989)		
3.22	Is the retention time window defined by injecting single compound standards over a 72 hour period and calculating the window as $\pm$ 3 times the standard deviation of the retention time for each standard?	(SW846)8000A,7.5.2 (7/92)		
3.23	Is a blank carried through all of the sample preparation and measurement steps?	(SW846)8000A,8.2 (7/92)		
3.24	Are blanks and QC check standards preserved the same as the samples and pH adjusted to 7 by adding phosphate buffer?	(ORDO)508,11.1 (1989)		
3.25	Is a single sample extracted for methods 606, 608, 609, 611 and 612 and are chromatographic conditions used for the simultaneous measurement of combinations of these parameters?	(CFR136)608,1.4 (6/86)		

3.26	Are additional clean-up techniques required for pesticide and PCB peak identification and detection using the appropriate Method 3620, 3660, 3665, 3630?	(SW846)8080A,7.4.8 (9/94)		
3.27	Is the GPC calibrated at least once per week to ensure that UV trace requirements, flow rate and column pressure criteria are acceptable and the retention time shift is less than 5% when compared to the last calibration trace?	(SW846)3640A,7.5 (9/94)		
3.28	Are a series of calibration standards processed through any cleanup procedure before use to validate elution patterns and the absence of interferences from the reagents?	(CFR136)608,7.6 (6/86)		

Item	Section 4 - Sample Handling Practices	Reference	Yes-No or NA	
4.1	Are sample containers glass bottles, protected from light with Teflon-lined screw caps?	(ORDO)508,6.1 (1989)		
4.2	Are samples iced or refrigerated at 4°C and kept in the dark from the time of collection until extraction?	(ORDO)508,8.2 (1989)		
4.3	Are samples preserved with sodium thiosulfate when residual chlorine is present prior to adding other chemical preservation?	(ORDO)508,8.2.2 (1989)		
4.4	Are samples for pesticides/PCB analysis extracted within 7 days and analyzed within 14 days of sample collection except when measuring unstable compounds which may require extraction immediately?	(ORDO)508,8.3.1 (1989)		
4.5	Are samples for pesticides/PCB analysis extracted within 7 days of collection and completely analyzed within 40 days of extraction?	(CFR136)608,9.3 (6/86)		
4.6	Is the sample adjusted to a pH range of 5.0 to 9.0 with sodium hydroxide or sulfuric acid when sample extraction is not performed with 72 hours of collection and is the amount of acid or base recorded?	(CFR136)608,9.2 (6/86)		

Item	Section 5 - Quality Control Practices	Reference	Yes-No or NA	
5.1	Is a new calibration standard or new calibration curve generated when the check standard response varies from the predicted response by more than 20% ?	(ORDO)508,9.3.3 (1989)		
5.2	Are calibration standards verified at least quarterly by analyzing a standard prepared from a reference material obtained from an independent source?	(ORDO)508,9.3.5 (1989)		
5.3	Is the calibration curve or RF verified each work day by measuring one or more calibration standards and is the response within ±15% of the predicted response?	(CFR136)608,7.4 (6/86)		
5.4	Are the calibration and QC acceptance criteria within the method specified limits and the laboratory's method criteria?	(SW846)8080A,8.2 (9/94)		
5.5	Is the laboratory reagent blank analyzed before any samples (or whenever new reagents are received) to demonstrate freedom from contamination that would prevent the determination of an analyte of interest?	(ORDO)508,10.2 (1989)		
5.6	Is the laboratory precision and accuracy demonstrated by analyzing at least four replicates of each analyte at the regulatory maximum contaminant level or 10 times the estimated detection limit whichever is lower?	(ORDO)508,10.3 (1989)		
5.7	Is the laboratory precision and accuracy demonstrated by analyzing four aliquots of each analyte at the method specified level?	(SW846)8000A,8.6 (7/92)		

5.8	Are four replicate quality control samples at the method specified concentration levels analyzed to determine the laboratory precision and accuracy?	(CFR136)608,8.2 (6/86)		
5.9	Is the mean accuracy of each analyte and surrogate during the initial demonstration of performance found to be ± 30 % of the value found in the method (or $R \pm 3S_R$)	(ORDO)508,10.3 (1989)		
5.10	Is the initial demonstration of capability performed any time modification are made to the GC column, GC conditions, GC detectors, continuous extraction techniques, concentration techniques, internal standards or surrogate compounds?	(ORDO)508,10.4 (1989)		
5.11	Is the surrogate recovery of the sample or method blank ± 30% of the true value?	(ORDO)508,10.5 (1989)		
5.12	Are the surrogate recoveries for samples, blanks and spikes within the method specified limits?	(SW846)8080A,8.3 (9/94)		
5.13	Is the internal standard response for any sample chromatogram within 30% of the daily calibration check standards when using internal standard calibration?	(ORDO)508,10.6 (1989)		
5.14	Is a laboratory fortified blank analyzed every 20 samples or one per sample set (samples extracted within a 24 hr period) and found to be within the control limits?	(ORDO)508,10.7 (1989)		
5.15	Is a laboratory fortified matrix analyzed every 10 samples and are precision, accuracy and method detection limits of analytes in each matrix in the same range as the laboratory fortified blanks?	(ORDO)508,10.8 (1989)		
5.16	Are the quality control check samples handled exactly in the same manner as the actual test samples and is the concentration of the QC check standard per the recommended concentration?	(SW846)3500A,8.5.2 (7/92)		
5.17	Is a spike or quality control sample analyzed a minimum of 10% of all samples when measuring wastewater?	(CFR136)608,8.1.4 (6/86)		
5.18	Is instrument performance monitored by analyzing a daily laboratory performance sample using the compounds and concentration specified in the method?	(ORDO)508,10.9 (1989)		
5.19	Is the recovery greater than 70% for the analyte(s) for the cleanup method using Gel Permeation chromatography?	(SW846)3640A,1.3 (9/94)		
5.20	Are all associated quality control samples processed through the clean up method?	(SW846)3640A,8.3 (9/94)		